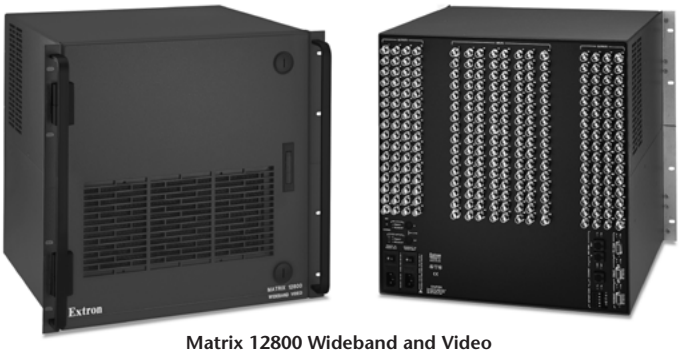
Matrix 12800 Series Matrix Switchers

FULLY CONFIGURABLE MATRIX SWITCHERS WITH DSVP™ FROM 32X16 TO 128X128

- I/O sizes to 128x128
- 375 MHz (-3 dB) video bandwidth, fully loaded – wideband models
- 150 MHz (-3dB) video bandwidth, fully loaded – low resolution models
- Compatible with composite video, S-video, component video, HDTV, RGsB, RGBS, RGBHV, and mono or stereo audio
- Field upgradeable and modular design
- Input and output connectors are clearly labeled
- Vertical interval switching
- Triple-Action Switching™ for RGB Delay
- 100 rooming memory presets
- 32 global presets
- Intuitive FPC 5000 LCD Front Panel Controller
- IP Link® Ethernet control and monitoring
- Optional redundant power supply

The Extron Matrix 12800 Series Matrix Switchers are the solution for very large-scale routing applications that require up to 128 inputs and 128 outputs. The cost-effective Matrix 12800 provides the performance, reliability, expandability, redundancy, and serviceability crucial to any mission-critical environment.

DESCRIPTION



Matrix 12800 Wideband and Video

Matrix 12800 Audio

The Extron Matrix 12800 Series Matrix Switchers are the solution for very large-scale routing applications that require up to 128 inputs and 128 outputs. A matrix switcher is the most important asset in a centralized A/V switching environment. The cost-effective Matrix 12800 provides the performance, reliability, expandability, redundancy, and serviceability crucial to any mission-critical environment. With convenient control via the FPC 5000 front panel controller, MKP 1200 remote keypad, MCP 1000 Master Control Panel, or RS-232 and RS-422 control, the Matrix 12800 will fit within any system design. The Matrix 12800 wideband provides modular switching of RGBHV, RGBS, RsGsBs, RGsB, component video, S-video, composite video, and/or two channel stereo audio. With video bandwidth of 150 MHz or 375 MHz (-3dB) when fully loaded, the Matrix 12800 maintains the integrity of any routed signal.

The Matrix 12800 Series includes video, wideband, sync, and audio models. A minimum 32x16 configuration is provided for lowband, wideband, and sync frames, and a minimum 16x16 configuration is provided for audio. Each model includes the flexibility to upgrade to 128x128. Internal cards are hot swappable, so there is no need to power down the matrix switcher during field upgrades or expansion. A full complement of BNC connectors on the rear panel and modular internal card slots are ready to be filled as needed, ensuring that the

MKP 1200 Remote

MCP 1000

Matrix 12800 matrix switchers can grow to accommodate any system — even systems that are still expanding. From the start, Extron offers service and support for the planning, installation, maintenance, as well as expansion of any Matrix 12800 system.

Self-Monitoring

The Matrix 12800 is an excellent choice for off-site or unmanned A/V systems, especially sensitive, 24 hours a day, 7 days a week environments. Features such as self-monitoring, redundant power, and cooling systems make the Matrix 12800 a uniquely reliable matrix switcher ideal for mission-critical applications in government, military, financial services, and many others. Advanced computer aided diagnostics provides 24-hour self-diagnostics of I/O boards, power supplies, controllers, cooling fans, and general functions of the switcher. Extron's exclusive DSVP™ - Digital Sync Validation Processing verifies active sources by scanning all inputs for active sync signals. DSVP then transmits the horizontal and vertical scan rate information to the user via any type of control system using RS-232 and RS-422 commands. A user may monitor the status of the Matrix 12800's sources, functions, and internal components remotely using RS-232 and RS-422 or IP Link® Ethernet communications.

Hot Swappable and Redundant Options

For mission-critical applications, the Matrix 12800 offers the convenience of hot swappable I/O boards, power supplies, controllers, and cooling fans. Hot swappable components allow the user to replace any part at any time without having to power down the matrix. This is especially useful for crucial applications that require continuous operation of the Matrix 12800. The user may expand the switcher or swap out components without disrupting the switcher's functions.

The primary and backup power supplies handle both positive and negative DC voltages and are internally mounted within the switcher. The primary power supply system is configured to support automatic fail-over to a hot spare power supply. This means zero downtime for the system and no loss of functionality should a power supply fail, a key feature when power reliability is crucial to the system. Both primary and redundant controllers monitor the matrix system. Should the primary controller fail, the redundant controller assumes management of the matrix system, providing added dependability. Also, installation and service are simplified because the power supplies are accessible through the front of the matrix switcher and do not require tools for removal.

Four cooling fans are provided for ventilation and heat management. Sensors notify the user of any failures — through visual cues, audio cues, or RS-232 and RS-422 communications. Fans and filters are also easily accessible through the front panel for maintenance and replacement.

Rooming Presets and Virtualization

Using a feature called rooming, the Matrix 12800 can be programmed to assign multiple outputs to specific rooms, allowing each room to have its own group of presets. Room presets offer unrivaled flexibility and convenience, particularly in systems that require switching between several locations. Once a room has been configured and stored, it is switched independently of other rooms so that signals sent to one room cannot be inadvertently switched to another room.

DESCRIPTION - Cont.

Rooming is made possible by user-defined virtual maps, which ascribe locality to the physical inputs and outputs of the Matrix 12800. Virtual mapping makes it possible to configure the switchers in unique ways, dictated by each virtual input/output i.e., the assignment of each individual connector, and each group of connectors, called a virtual plane. Extron virtualization/control software makes these configurations possible. The software easily translates the appropriate virtual map into the switcher's memory with minimal effort on the part of the installer.

Matrix 12800 matrix switchers also offer global presets that can be set to define configurations of specific inputs to any specific combination of outputs or to all outputs. Rooming presets and global presets can be programmed and recalled at the front panel or by remote control.

The convenient features and the hot swappable, modular design make the Matrix 12800 the best choice for very large-scale routing applications.

FPC 5000

The FPC 5000 Front Panel Controller is an intuitive, 12.1 inch touch-screen, control interface designed exclusively for the Matrix 12800. The easy-to-use FPC 5000 can control, monitor, access, and manage all of the Matrix 12800 matrix switcher set-up and control functions via comprehensive, menu-driven interface. Any user, regardless of their technical proficiency, can easily navigate through its simple and straightforward menus to change, monitor, or control the features of the Matrix 12800. With IP Link Ethernet capabilities, the FPC 5000 can access the matrix from anywhere on a network, from one or more sites, as well as via the Internet. Housed within a 7U panel, the FPC 5000 can be installed in a rack, podium, or control console.

FPC 5000

IP Link® Ethernet Control

The Matrix 12800 Series is equipped with Extron's IP Link, an IP integration technology specifically engineered to meet the needs of professional A/V environments — from K-12 classrooms to large universities, businesses, and residential media systems.

IP Link is built around an integrated, high performance Web server that features global compatibility with industry standard Ethernet communication protocols, multi-user support, and GlobalViewer® software. GlobalViewer, a Web-based application, enables a variety of asset management functions including proactive maintenance and remote technical support from any administrator authorized LAN, WAN, or Internet client.

On the Matrix 12800 Series, IP Link provides technical support personnel with the ability to receive service and failure messages through an e-mail-enabled cell phone, PDA, pager, or e-mail account. Utilizing IP Link, the help desk can also view embedded Web pages to manage, monitor, and troubleshoot the switcher for the following:

Asset Management

- Remotely select input and output ties for audio only, video only, or audio and video
- Name and select global I/O presets
- Set audio input and output volume levels
- Set RGB delay time for glitch-free transitions
- Upload firmware updates via the Internet

Operating Status and Diagnostics

- Monitor primary and redundant power supply voltages
- Monitor operating temperature
- Recall firmware revision and other data for improved Help Desk support
- Provides immediate notification via e-mail for loss of input signal, power supply failure, and other critical service information
- Upload firmware updates

DSVP

- Verify active sources by polling inputs for horizontal and vertical sync rate information

FEATURES

- **375 MHz (-3 dB) RGB video bandwidth, fully loaded - wideband models** – Designed for the most demanding, very high resolution computer-video rates without signal degradation. The Matrix 12800 Series provide a minimum 375 MHz (-3 dB) of RGB video bandwidth at full performance capability when one input drives all outputs.
- **150 MHz (-3 dB) video bandwidth, fully loaded - low resolution models** – For lower resolution video signals where high bandwidth is not required, such as composite video, S-video, and component video systems.
- **Compatible with composite video, S-video, component video, HDTV, RGsB, RGBS, RGBHV, and mono or stereo audio**
- **Excellent channel-to-channel isolation** – The Matrix 12800 provides excellent isolation between channels and extremely low electromagnetic emissions perfect for minimizing signal leakage in high security or government environments.
- **Field-upgradeable and hot swappable, modular design** – The Matrix 12800 provides the highest level of flexibility, expandability, and affordability by allowing users to purchase only the modules required for their systems. Additional input and output cards may

FEATURES - Cont.

be added at any time through the front panel for easy and quick upgradeability or expansion. Hot swappable components allow the user to replace any part at any time—no need to power down the switcher. This is especially useful for crucial applications that require continuous operation.

- **Advanced computer-aided diagnostics** – Provides 24-hour self-diagnostics of input/output boards, primary and redundant power supply voltages, controllers, cooling status, and overall functional status of the matrix. Status monitoring is possible via serial Ethernet remote control for off-site or unmanned locations, such as telco, government, military, or any other sensitive, 24 hours a day, 7 days a week environments.

- **Easy maintenance and serviceability for low meantime to repair** – With the front panel allowing full accessibility to the internal workings and modular assemblies, the basic architecture of the matrix allows for easy maintenance and serviceability, as well as low mean-time to repair.

- **Dual, fully redundant, and hot swappable power supplies and cooling fans** – Primary and back-up controllers, power supplies, and cooling fans provide added reliability for critical applications. The optional redundant controller provides mirrored memory, CPU and auto-failover capabilities, and a secondary RS-232 port, enabling a redundant third party control system to communicate with the matrix system. It also provides an increased level of reliability by adding an additional controller that assumes management of the matrix system should a primary controller failure occur.

- **Two AC power inputs** – For added power reliability, some 24-hour environments offer two separate AC power sources, one as the primary source and the second as a redundant one. The Matrix 12800 offers two AC power inputs for continuous connection to both power sources.

- **Trouble status indication** – The SmartControl microprocessor within the CPU of the Matrix 12800 acts as a status indicator at all times.

- **Triple-Action Switching™ for RGB Delay** – Blanks the screen when switching to a new source. The new sync signals precede the RGB signals, so there is no glitch shown during the transition. The time delay between the RGB and sync signals is adjustable up to five seconds through front panel, IP Link, or serial control.

- **DSVP™ - Digital Sync Validation Processing** – Verifies active sources by polling all inputs for valid sync signals. DSVP then transmits the horizontal and vertical sync information to the user through the serial or IP Link ports.

- **Rooming and presets** – The Matrix 12800 can be configured for several different applications without the need to change the settings each time the application changes.

- **Video interval switching** – Enables smooth, seamless transitions when switching between syncronous video sources.

- **Extron virtualization/control software** – For RS-232 and RS-422 remote control from a PC, Extron ships our Windows®-based control software with every matrix switcher. This icon-driven software uses a graphical, drag-and-drop interface to make I/O configuration and other customization functions simple and convenient. This software also offers an emulation mode for configuration of an offsite matrix switcher; the I/O configuration may then be saved for future downloading to the matrix switcher.

- **Balanced or unbalanced audio** – The Matrix 12800 switches both balanced or unbalanced mono or stereo audio signals. Depending on the application and cable distance requirements, some systems will require balanced audio.

- **Audio input gain and attenuation** – Allows users to set the level of gain or attenuation for each audio input channel, eliminating noticeable differences in volume when switching between sources.

- **Audio breakaway** – Provides the capability to break an audio signal away from its corresponding video signal, allowing the audio channels to be operated as a separate matrix switcher.

- **RS-232 and RS-422 serial control port** – Using serial commands, the Matrix 12800 Series can be controlled and configured via the included Windows-based control software, or integrated into third-party control systems. Extron products use the SIS™ - Simple Instruction Set command protocol, a set of basic ASCII code commands that allow for quick and easy programming.

- **IP Link Ethernet control and monitoring** – An exclusive technology developed by Extron specifically engineered to meet the needs of professional A/V environments, which enables the Matrix 12800 to be controlled and proactively monitored over a LAN, WAN, or the Internet. An intuitive Web interface is also included for such common functions as I/O switching, system control, and online diagnostics and monitoring.

- **Optional FPC 5000 LCD Front Panel Controller** – Can control, monitor access, and manage all of the Matrix 12800 switcher set-up and control functions via any local area network or Internet connection.

- **Optional control panels and keypads** – Provide the flexibility to control a Matrix 12800 Series matrix switcher from a remote location.

- **Rack-mountable**

- **Internal international power supply**

SPECIFICATIONS

VIDEO — WIDEBAND/VIDEO BMES

Routing	32 x 16 or larger matrix up to 128 x 128, depending on the configuration
Gain	Unity
Bandwidth	
Wideband models	375 MHz (-3 dB), fully loaded
0 MHz to 10 MHz	no more than +0.1 dB to -0.1 dB
0 MHz to 130 MHz	no more than +4 dB to -0.25 dB
Video models	150 MHz (-3 dB), fully loaded
0 MHz to 10 MHz	no more than +0.1 dB to -0.1 dB
0 MHz to 30 MHz	no more than +0.5 dB to -0.5 dB
Phase between I/Os	<1.28° at 3.58 MHz
Differential phase error	0.1%, 3.58 to 4.43 MHz
Differential gain error	0.1°, 3.58 to 4.43 MHz
Max. propagation of delay	5 ns typical (±1 ns)
Crosstalk	-80 dB @ 1 MHz, -62 dB @ 10 MHz, -52 dB @ 30 MHz
Switching speed	200 ns (max.)

VIDEO INPUT — WIDEBAND/VIDEO BMES

Number/signal type	
Wideband models	Up to 128 (varies with configuration) RGBHV, RGBS, RGsB, RsGsBs, component video, S-video, composite video
Video models	Up to 128 (usable quantity varies with configuration) component video, S-video, composite video
Connectors	128 BNC female (usable quantity varies with model)
Nominal levels	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB 0.3 Vp-p for R-Y and B-Y of component video, and for C of S-video
Minimum/maximum levels	Analog: 0.5 V to 1.5 Vp-p with no offset
Impedance	75 ohms
Return loss	<-30 dB @ 5 MHz

VIDEO OUTPUT — WIDEBAND/VIDEO BMES

Number/signal type	Up to 128 (varies with configuration) RGBHV, RGBS, RGsB, RsGsBs, component video, S-video, composite video
Connectors	128 BNC female (usable quantity varies with model)
Nominal levels	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB 0.3 Vp-p for R-Y and B-Y of component video, and for C of S-video
Maximum level	2 Vp-p
Impedance	75 ohms
Return loss	-25 dB to input section @ up to 50 MHz
DC offset	±10 mV typical with input at 0 offset
Switching type	Triple-Action™
Slew rate	>200 V/ms

SYNC — SYNC BME

Input and output types	Software configurable for RGBHV or RGBS
Sync connectors	Up to 128 BNC female (usable quantity varies with configuration)
Input level	0.5 V to 5 Vp-p (4 Vp-p nominal)
Output level	5 Vp-p
Gain	AGC to TTL: 4.0 V to 5.0 Vp-p
Input impedance	Inputs 1 - 32: 510 ohms or 75 ohms, switchable Inputs 33 - 128: 510 ohms
Output impedance	75 ohms
Horizontal frequency	15 kHz to 150 kHz
Vertical frequency	30 Hz to 150 Hz
Polarity	Positive or negative (follows input)

AUDIO — AUDIO BME

Routing	16 x 16 up to 128 x 128 mono or stereo matrix (in increments of 16), balanced/unbalanced
Gain (selectable per output)	Unbalanced output:0dB or -6 dB (jumper-selectable) Balanced output: +6 dB or 0 dB
Frequency response	20 Hz to 20 kHz, ±0.05 dB
THD + Noise	0.03% @ 20 Hz to 20 kHz, +15 dBu input, +21 dBu output
S/N	>85 dB, balanced, at rated maximum output
Crosstalk	<-70 dB @ 20 Hz to 20 kHz fully loaded

AUDIO — AUDIO BME - Cont.

Stereo channel separation	>70 dB @ 20 Hz to 20 kHz
CMRR	>+75 dB, 20 Hz to 20 kHz

AUDIO INPUT — AUDIO BME

Number/signal type	16 to 128 (in increments of 16) mono or stereo, balanced/unbalanced
Connectors	(16 to 128) 3.5 mm captive screw connectors, 5 pole
Impedance	>10k ohms unbalanced/balanced, DC coupled
Nominal level	+4 dBu (1.23V), 0 dBu (0.775 V), -10 dBV (316 mV), -20 dBV (100 mV)
Maximum level	+21.5 dBu, (balanced or unbalanced) at 1%THD+N
Input gain adjustment	-24 dB to +9 dB, adjustable per input

NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu

AUDIO OUTPUT — AUDIO BME

Number/signal type	16 up to 128 (in increments of 16) mono or stereo, balanced/unbalanced
Connectors	(16 to 128) 3.5 mm captive screw connectors, 5 pole (quantity varies with configuration)
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1 dB channel to channel
Maximum level (Hi-Z)	>+26.0 dBu, balanced at 1%THD+N
Maximum level (600 ohm)	>+24.0 dBm, balanced at 1%THD+N

CONTROL/REMOTE — SWITCHER

Serial control port	RS-232 or RS-422, 9-pin female D connector
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Ethernet control port	1 RJ-45 female connector
Ethernet data rate	10/100Base-T, half/full duplex with autodetect
Ethernet protocol	ARP, ICMP (ping), TCP/IP, Telnet, HTTP, SMTP
System intercommunications	2 RJ-45 connectors
Remote keypad control	(2) 5 mm, 5-pole captive screw connectors
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™) Microsoft® Internet Explorer, Netscape® Navigator®, Telnet

GENERAL

Power	2 (positive-negative), 100 VAC to 240 VAC, 50/60 Hz; internal, autoswitchable
Matrix 12000 wideband	150 watts at 115 VAC, 60 Hz
Matrix 12800 sync	100 watts at 115 VAC, 60 Hz
Matrix 12800 audio	300 watts at 115 VAC, 60 Hz

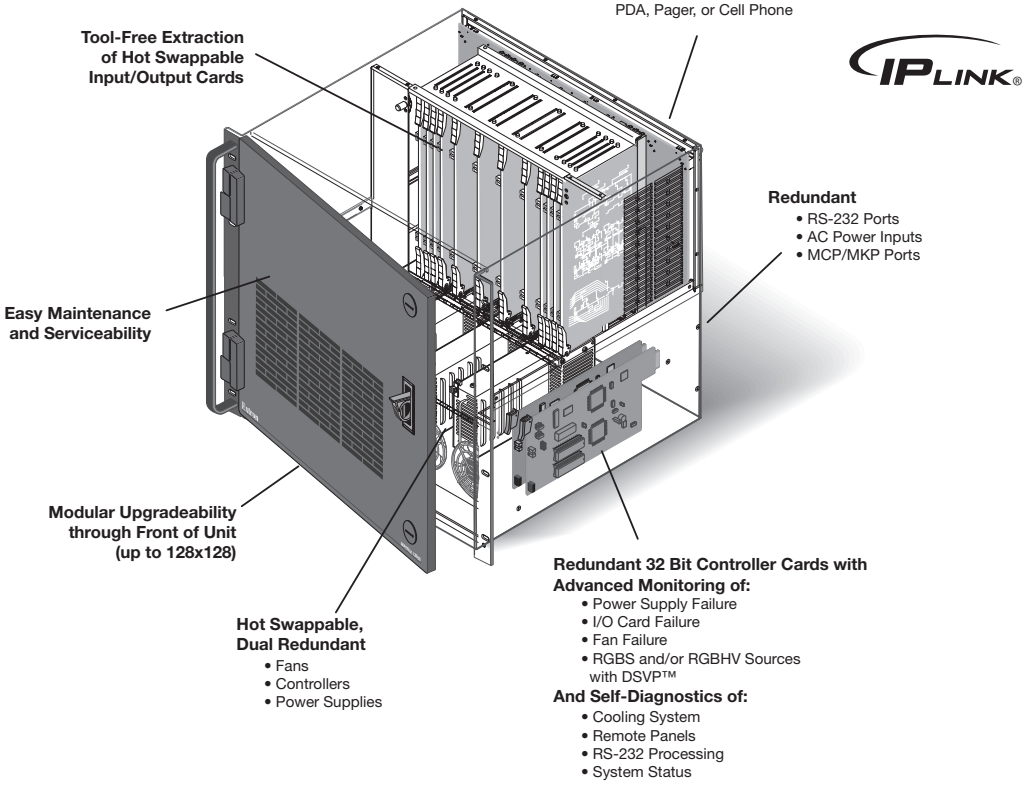
NOTE: A redundant power supply is available.

Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Rack mount	Yes
Enclosure type	Metal
Enclosure dimensions	17.5" H x 17.0" W x 16.0" D (10U high, full rack width) 44.4 cm H x 43.2 cm W x 40.6 cm D (Depth excludes connectors. Width excludes rack ears.)
Product weight	
Matrix 12800 wideband	57.4 lbs (26.0 kg)
Matrix 12800 sync	54.0 lbs (24.5 kg)
Matrix 12800 audio	43.9 lbs (19.9 kg)
Shipping weight	
Matrix 12800 wideband	76.7 lbs (35 kg)
Matrix 12800 sync	73.3 lbs (34 kg)
Matrix 12800 audio	66 lbs (30 kg)
DIM weight, international (all models)	77 lbs (35 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

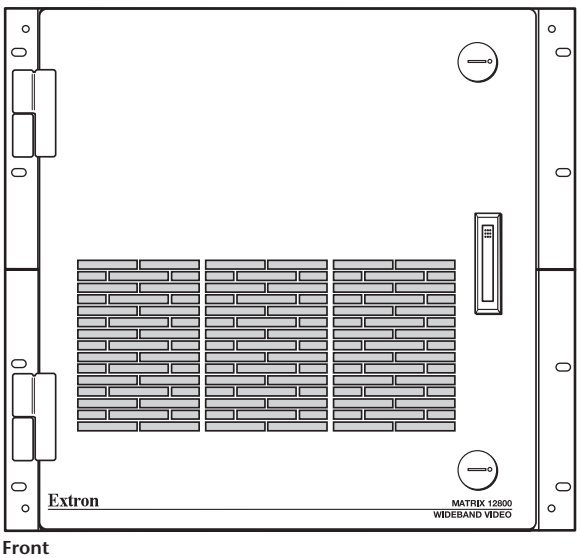
NOTE: All nominal levels are at ±10%.

Specifications are subject to change without notice.

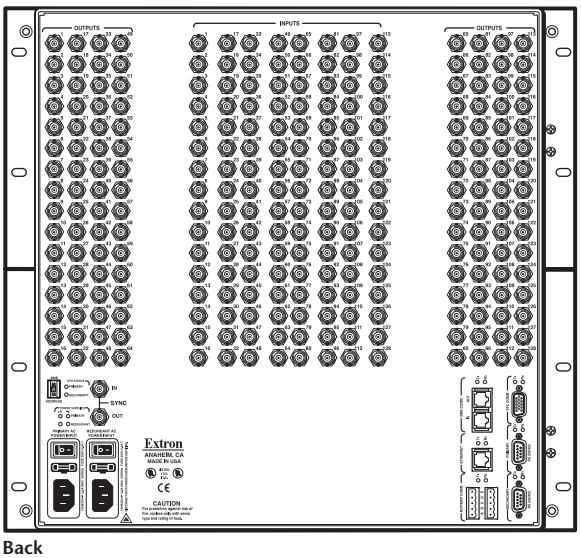
APPLICATION DIAGRAM


IP Link Ethernet Control
• Use any Browser such as MS Explorer or Netscape Navi
• Convenient Remote Control over Networks and the Inter
• Online Diagnostics and Monitoring
• Receive Failure and Service Messages through e-mail, PDA, Pager, or Cell Phone
IPLINK®
Tool-Free Extraction of Hot Swappable Input/Output Cards
Redundant
• RS-232 Ports
• AC Power Inputs
• MCP/MKP Ports
Easy Maintenance and Serviceability
Modular Upgradeability through Front of Unit (up to 128x128)
Hot Swappable, Dual Redundant
• Fans
• Controllers
• Power Supplies
Redundant 32 Bit Controller Cards with Advanced Monitoring of:
• Power Supply Failure
• I/O Card Failure
• Fan Failure
• RGBS and/or RGBHV Sources with DSVP™
And Self-Diagnostics of:
• Cooling System
• Remote Panels
• RS-232 Processing
• System Status

PANEL DRAWINGS



Front



Back

Extron Electronics, USA
1230 South Lewis Street
Anaheim, CA 92805
800.633.9876 714.491.1500
FAX 714.491.1517

Extron Electronics, Europe
Beeldschermweg 6C, 3821 AH Amersfoort
The Netherlands
+800.3987.6673 +31.33.453.4040
FAX +31.33.453.4050

Extron Electronics, Asia
135 Joo Seng Rd. #04-01
PM Industrial Bldg.
Singapore 368363
+65.6383.4400 FAX +65.6383.4664

Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan
+81.3.3511.7655 FAX +81.3.3511.7656

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